



**City of Bellevue
Development Services Department
Land Use Division Staff Report**

Proposal Name: Verizon Wilburton "Small Cell" Wireless Communications Facility

Proposal Address: 19 Locations – South Bellevue in the Wilburton/NE 8th Subarea

Proposal Description: Administrative Conditional Use approval for a 19 node "small cell" wireless network which includes placing antennas and "small cell" radio units on 19 replacement Puget Sound Energy utility poles.

File Number: 18-112112-LA Administrative Conditional Use

Applicant: MD7, LLC representing Verizon
Becky Todd

Decisions Included: Administrative Conditional Use Approval (Process II, Land Use Code 20.30E)

Planner: Leah Chulsky, Associate Planner

**State Environmental Policy Act
Threshold Determination:** EXEMPT - WAC 197-11-800 (25)(a)(i)

Director's Recommendation: **Approval with Conditions**
Michael A. Brennan, Director
Development Services Department

By: 
Elizabeth Stead, Land Use Director

Notice of Application: July 12, 2018
Notice of Decision: May 9, 2019
Appeal Deadline: May 23, 2019

For information on how to appeal a proposal, visit the Development Services Center at City Hall or call (425) 452-6800. Appeal of the Decision must be received in the City Clerk's Office by 5 PM on the date noted for appeal of the decision.

I. Request/Proposal Description

A. Request

The applicant (Verizon) is requesting Administrative Conditional Use approval to construct a “small cell” network in the Wilburton NE 8th Subarea (Small cell facilities are a type of wireless broadband infrastructure. They typically take the form of small antennas that are placed on existing infrastructure). The network will be made up of 19 nodes. The nodes will have antennas and equipment placed on taller replacement (up to 12 ft. as needed for separation requirements) Puget Sound Energy utility poles to accommodate coverage objectives and avoid conflicts with electrical infrastructure. All nodes will be located within the public right of way, where utilities are typically placed. This will be a “small cell” antenna system placed on replacement support structures (PSE utility poles).

Nodes on Replacement PSE Utility Poles:

Each node will consist of two “small cell” antennas, two remote radio units (RRU) in one RRU enclosure, a disconnect box, and aerial fiber (wire) that will connect all these nodes. There will be no ground-mounted equipment at any of the nodes. The utility poles are owned and constructed by PSE.

Refer to Attachment A to this report for project drawings which include photo-simulations and design drawings for each node.

“Small cells” are a new way of providing faster data coverage and increased capacity for mobile phone and device users. Within residential neighborhoods such as Wilburton, the “small cell” network is being proposed to provide service to customers in neighborhoods that were identified as needing additional coverage and/or capacity. With “small cell” installations, the actual coverage area for each facility (pole/node) is relatively small as compared to the more common “macrocells” – typically a block or two versus one mile or more with “macrocell” sites. Thus, the installations must be placed close to the customers – meaning more nodes spaced closer together within a larger neighborhood context. **Refer to coverage map in Attachment A and in the project file.** Coverage is typically hindered by topography and mature trees – both of which are major characteristics found in the Wilburton Subarea.

B. Process:

The proposed project to construct 19 new wireless installations on replacement PSE utility poles in the right of way must undergo a publicly noticed administrative review process. This proposal has been submitted by Verizon, a private company. It is important to note that this is *not* a City-sponsored proposal, nor is it a PSE proposal. The City is tasked with reviewing all development applications against the applicable City codes and standards. Because none of the proposed installations are within 520 feet of each other or within 520 feet of any other WCF located either in the public right-of-way or on property owned by the City, the proposal will require review as a new Administrative Conditional Use (ACU) instead of a full Conditional Use per Land Use Code (LUC) 20.20.195.C.

The ACU approval is a Process II decision made by the Director of the Development Services Department. The review includes public noticing with a *minimum* 14-day comment period. Public comment is received and reviewed by Land Use up until the decision staff report is written. At the Director’s discretion,

a public meeting may be held. The Director's decision shall be written in a staff report to indicate whether the application has been approved, approved with conditions, or denied. The decision will be publicly noticed with a mandatory 14-day appeal period. A Process II decision may be appealed by any Party of Record and the appeal shall be heard at a public hearing before the City Hearing Examiner.

Per Washington Administrative Code (WAC)197-11-800 (25)(a)(i), the proposal is EXEMPT from State Environmental Policy Act (SEPA) review.

II. Site Description and Zoning

A. Site Description:

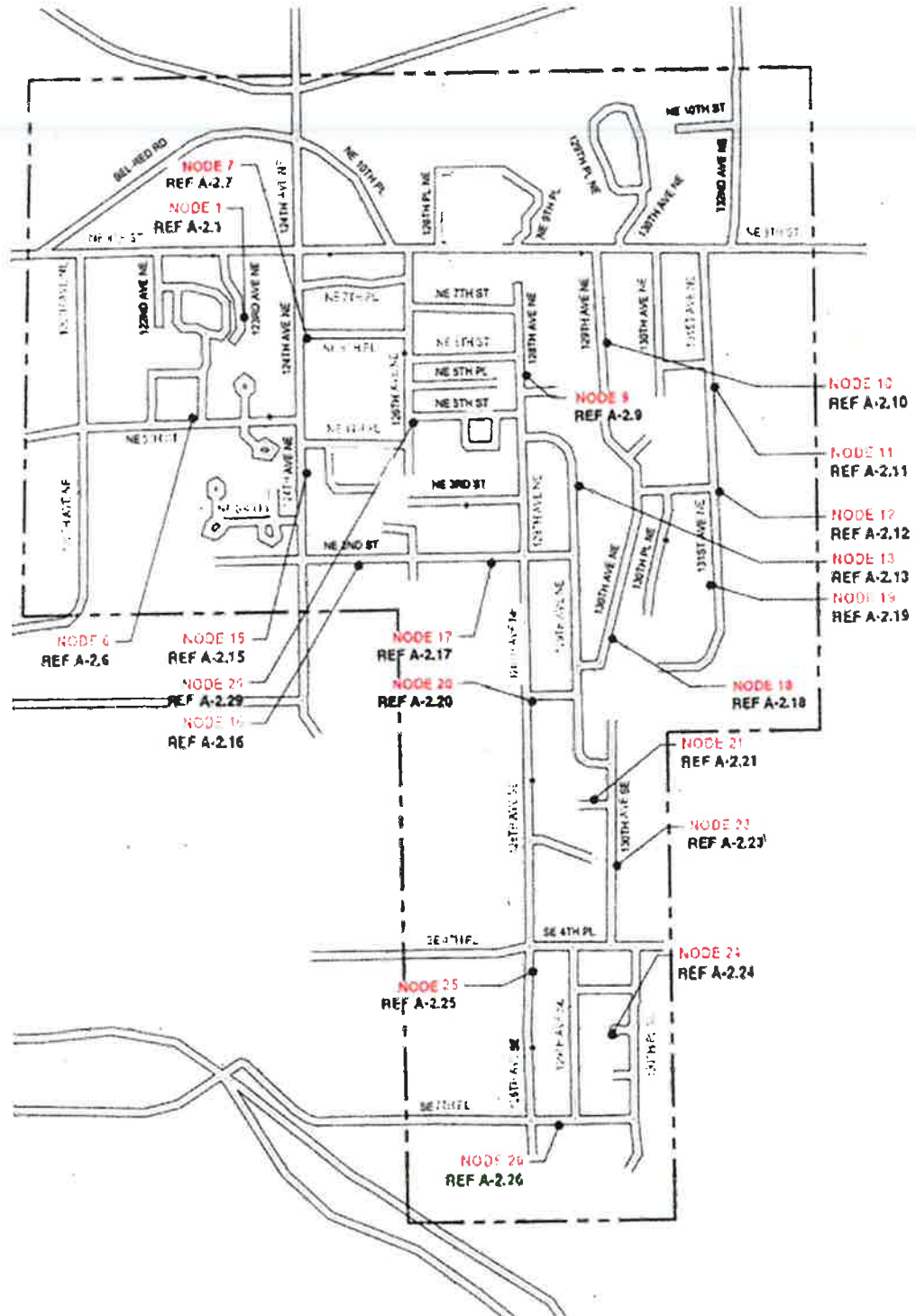
The proposed Wilburton installations (referred to as nodes) are to be located on replacement PSE utility poles in Wilburton residential neighborhoods. All of the poles and node locations are in the public right of way. **Refer to project drawings A-1 site plans showing locations in Attachment A to this report.**

Node Locations*

* Note that while the numbering of the Nodes goes up to 30, Numbers 1, 2,3,4,5,8,14,22,27,28, and 30 were not used in Verizon's numbering system.

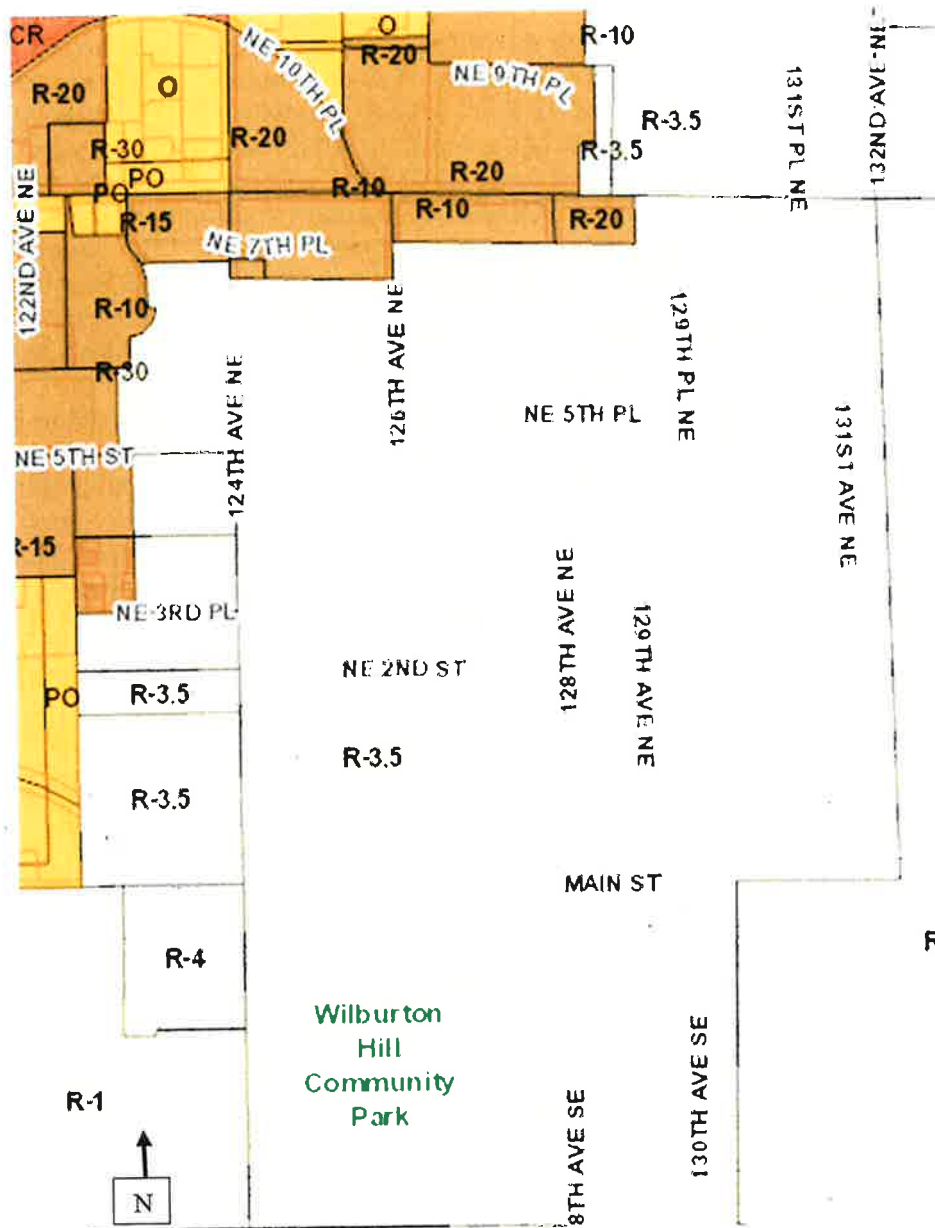
Node 6:	512 121 st PL NE	Node 18:	118 130 th Ave NE
Node 7:	600 124 th Ave NE	Node 19:	161 131 st Ave NE
Node 9:	12804 NE 5 th PL	Node 20:	4 128 th Ave NE
Node 10:	600 129 th PL NE	Node 21:	12840 SE 2 nd St
Node 11:	522 131 st Ave NE	Node 23:	404 130 th Ave SE
Node 12:	300 131 st Ave NE	Node 24:	12923 SE 5 th PL
Node 13:	234 129 th Ave NE	Node 25:	434 128 th Ave NE
Node 15:	315 124 th PL NE	Node 26:	12815 SE 7 th PL
Node 16:	12431 NE 2 nd St	Node 29:	12609 NE 5 th St
Node 17:	12649 NE 2 nd St		

APPROXIMATE NODE LOCATIONS



B. Zoning and Context

All 19 Nodes lie within residential land use districts. 37 of the nodes fall within single family land use districts (R-3.5).




III. Public Comments

The City initially notified the public of this proposal on July 12, 2018 with mailed notice and publication in the *Weekly Permit Bulletin*. One, double-sided public information sign was installed in front or near each of the initially proposed 19 nodes (adjacent to the utility poles) on the same day.

A summary of the public comments and responses are below:

1. Is this equipment safe? What are the dangers of being exposed to this type of cellular equipment?

Response: Verizon Wireless equipment operates within the guidelines set by the Federal Communications Commission (FCC) for exposure to RF emissions – FCC “Rules & Regulations” Title 47 CFR 1.1310, Radiofrequency radiation exposure limits. David J. Pinion, PE of the consulting electrical engineering firm of Hatfield & Dawson, has verified in the April, 2018 Non-Ionizing Electromagnetic Exposure Analysis and Engineering Certification report, submitted with this permit application, that the proposed “small cell” system will meet these RF emission/exposure standards. Additional documentation titled SEA Wilburton RF Documentation was provided by Krystal Taylor, Radio Frequency Engineer for Verizon Wireless. It provides additional RF information for this proposal.

The proposed antennas will project the majority of the transmitted RF energy horizontally away from the project poles, and above all nearby habitable areas. Very little energy will be directed downwards towards ground level or the nearest occupants. Based on the report submitted, the maximum predicted public exposure condition is less than 1/35th of the 100% MPE FCC limit. Therefore, the proposed Verizon small cell facility will not cause any occupancy or habitable area of a structure to exceed the FCC limits for human exposure to radio frequency fields.  RF information can be found in Attachments this report. Refer to Condition of Approval regarding RF testing in Section VI of this report.

2. Can the equipment be moved to other poles not in front of specific homes?

Response: Each node was chosen because of the location and is ideally spaced for that network design. These locations will not require the construction of any new, single-purpose poles. If any of the locations are moved, the nodes would be too close to other nodes and would create RF interference. The nodes were approved for location and installation by PSE who has specific location requirements and the network was designed around these requirements. The City of Bellevue did not choose this neighborhood. This is a Verizon wireless communications facility and as such, the locations for the “small cell” system and each of the nodes were selected by Verizon Wireless and were based on Verizon’s specific network needs. The City’s only involvement in this proposal is the review of the ACU permit application for compliance with City codes and the review of any required ancillary permits.

3. Who will be overseeing what the cellular company does. Who is policing or governing their actions?

Response: The City of Bellevue, through permit review and permit inspections, oversees the WCF installations. In addition to this ACU approval, Verizon will be required to obtain a Right-of-Way Use Permit and a Wireless Communications Facilities (WCF) in the Right of Way Permit from the City. In addition, prior to activation, the applicant will be required to have an inspection of each node by Land Use to ensure that the facilities were installed per the drawings in this approval and subsequent permits. Lastly, Verizon will perform pre- and post-installation RF testing on a minimum of three poles to confirm compliance with FCC regulations. The test results will be submitted to Land Use for inclusion in this project file. **Refer to Conditions of Approval regarding the Right of Way Use Agreement, the Right of Way Permit, radio frequency testing and completion of work/facility activation in Section VI of this report.**

4. When does the permit have to be approved or denied?

Response: The City is tasked with reviewing WCF applications as quickly as possible. The FCC has promulgated rules that require a reasonable amount of time for wireless companies to secure permit approvals. Companies may seek injunctive relief in federal court against local jurisdictions that fail to meet FCC timelines. Public comment was taken by Land Use from the date of the Notice of Application until this decision staff report was written and the decision noticed.

5. Who is responsible for property restoration associated with installation?

Response: There may be minor clearing associated with the installation of the replacement utility poles. All work will be in the public right of way and should not trigger a clearing and grading permit. However, this work will require a Right of Way Permit. Any disturbance to the right of way, including the trenching for the underground fiber, must be restored to an equal or better condition and right of way disturbance will be reviewed and controlled under the Right of Way Use Permit. Construction hours will be determined under the Right of Way Use Permit to minimize impacts to surrounding residential neighborhoods and schools. **Refer to Condition of Approval regarding the Right of Way Use Permit in Section VI of this report.**

IV. Applicable Decision Criteria / Findings and Conclusions

Compliance with the decision criteria of Land Use Code Section 20.30E.140 (Administrative Conditional Use Permit) is discussed below.

A. The administrative conditional use is consistent with the Comprehensive Plan.

As conditioned, the proposal is consistent with the policies found in the Utilities section of the City of Bellevue Comprehensive Plan, Volume 1. The Utilities policies listed below are particularly relevant to the City's decision on this specific wireless application:

UT-46. Support new and emerging information and telecommunications technologies that would benefit utility service delivery by being sustainable, appropriate and viable.

UT-50. Encourage widespread, affordable, high-speed internet access, including access to competing telecommunications services and new forms of technology to provide the community with choice and to facilitate innovation.

UT-51. Maintain Bellevue's competitive advantage and attraction as a highly connected community.

Finding: The City's Land Use Code allowing this proposed facility is in place to support policies that place the provision of high-speed internet access throughout the entire City as a high priority.

UT-53. Ensure a permitting process that achieves a balance between encouraging deployment of advanced high-speed telecommunications infrastructure and protecting neighborhood character.

UT-61. Allow new aerial telecommunication lines on existing systems provided that they shall be designed to address visual impacts and are required to be placed underground at the time of undergrounding electrical distribution lines.

UT-64. Require the reasonable screening and/or architecturally compatible integration of all new utility and telecommunication facilities.

UT-65. Protect Bellevue's aesthetic quality and infrastructure investment from unnecessary degradation caused by the construction of telecommunication infrastructure.

UT-67. Encourage consolidation on existing facilities where reasonably feasible and where such consolidation leads to fewer impacts than would construction of separate facilities. Examples of facilities which could be shared are towers, electrical, telephone and light poles, antenna, substation sites, trenches, and easements.

UT-79. Require the placement and design of wireless communication facilities in a manner that minimizes the adverse impacts on adjacent land uses.

- ***Finding:*** The design of "small cell" systems, with small antenna and RRU dimensions, is intended to reduce the visual and aesthetic impacts of these facilities, particularly when co-located on utility poles with existing electrical equipment or on neighborhood light poles. All antennas, mounts, conduits (including existing non-Verizon conduits on the pole), and ancillary equipment will be painted a shade of brown to match each existing pole. There will be no equipment, including meters, on the ground. Additional cabling diagrams will be required to ensure that the amount of exposed cable/wires is minimized and that all cabling is pulled tight. **Refer to Condition of Approval regarding antennas mounting and cabling, antenna and equipment color, ground mounted equipment, noise, and expansion beyond "small cell" in Section VI of this report.**

UT-83. Recognize that wireless communication facilities will be deployed in all areas of the city to provide coverage and capacity consistent with the changing use of wireless technology. Minimize the attendant impacts, particularly the visual impacts of, wireless communication facility towers, lattice towers and structures by

utilizing criteria for the design and location of such facilities that appropriately balance the need for wireless services and the impacts of the necessary facilities.

UT-85. Minimize visual impacts of wireless communication facilities by encouraging system designs in the following preferred and descending order:

1. Attached to public facility structures, building mounted, or integrated with utility poles, light standards, and signal supports;
2. Co-located on utility poles, light standards, signal supports; and
3. Free standing towers.

Finding: The electrical service in the residential neighborhoods to be served by this proposal currently is delivered either by overhead distribution and transmission lines or through underground electrical service. The proposed “small cell” installations will all be co-located on replacement PSE utility poles in the public right of way, which are the second preferred locations per the Comprehensive Plan and the Land Use Code.

UT-84. Minimize visual impacts of wireless communication facilities by encouraging deployment in land use districts in the following preferred and descending order when possible, considering the provider’s coverage needs:

1. Nonresidential land use districts, except Transition Areas;
2. Transition Areas;
3. Multifamily (R-20 and R-30) districts; and
4. Park sites and Residential districts.

Finding: The entire coverage area shown in the submitted propagation maps for the WCF consists of residential properties that are important to Verizon’s coverage objectives. Because of the relatively short reach of the “small cell” antennas, each antenna needs to be close to the residences that they intend to serve, which requires that they be located within single family and multi-family land use districts. Aesthetic treatments are proposed to make the facility as visually unobtrusive to adjacent residences as possible. While the poles themselves fall within residential land use districts, they are physically located within the existing right of way and not on any private residential properties.

UT-86. Require timely removal of abandoned facilities that are visually intrusive whenever facilities are replaced or upgraded.

Finding: It is a requirement of the Land Use Code (LUC 20.20.195.D.8) and a Condition of this decision that any of the installations must be removed by the facility owner within 90 days of the date it ceases to be operational, or if the facility falls into disrepair and is not maintained. **Refer to Condition of Approval regarding removal of abandoned sites in Section VI of this report.**

B. The design is compatible with and responds to the existing or intended character, appearance, quality of development and physical characteristics of the subject property and immediate vicinity;

Finding: The project will be compatible with the surrounding residential neighborhood due to the following:

- 1) The antennas and RRU's will be placed on replacement PSE utility poles (additional height up to 12 ft. to accommodate separation requirements) where there is already utility infrastructure including aerial fiber (electrical wires).
 - Existing poles will be replaced with new wood poles in the same location. All are located within the right of way on major arterial streets. Replacement poles will have a maximum height increase of 12 feet to accommodate wireless equipment and required electrically clearances.
 - All antennas, mounts, conduits (including existing non-Verizon conduits on the pole), and ancillary equipment will be painted a shade of brown to match each existing utility pole or light pole.
 - Additional cabling diagrams will be required as part of the construction permits to ensure that the amount of exposed cable/wires is minimized and that all cabling is pulled tight.

Refer to Condition of Approval regarding antenna mounting and cabling, antenna and equipment color, ground mounted equipment, and site restoration in Section VI of this report.

- C. The administrative conditional use will be served by adequate public facilities including streets, fire protection, and utilities.**

Finding: The existing poles and the proposed WCF's will be served by adequate public facilities, including streets, fire protection, and utilities.

The Fire Department has reviewed this application and has determined that there are no substantial concerns regarding interference with emergency signals. **Refer to Conditions of Approval regarding existing City of Bellevue existing radio systems and interference in Section VI of this Staff Report.**

- D. The administrative conditional use will not be materially detrimental to uses or property in the immediate vicinity of the subject property; and**

Finding: Through the application of City codes that govern wireless communications facilities, the co-location of two "small cell" antennas and one remote radio unit enclosure on replacement PSE utility poles will result in a WCF system that will not substantially impact the surrounding properties. "Small cell" antennas and equipment are smaller in size and emit considerably lower RF emissions than traditional "macrocell" installations. They will benefit the neighborhoods surrounding each node by delivering improved wireless service to areas where Verizon has identified coverage and capacity gaps.

A condition of approval will require that antennas, mounts, conduits, and all ancillary equipment be painted brown to match the utility pole or light pole to which they are attached and there will be no ground-mounted equipment. In addition, equipment and installation techniques have been designed to be as unobtrusive as possible. As a result, the project will not be materially detrimental to uses or property in the immediate vicinity.

Finally, the facility will be removed when it ceases to be operational or falls into disrepair and is not maintained, or if the utility support structure is removed or placed underground. **Refer to Condition of Approval regarding antenna and equipment color and the removal of abandoned sites in Section VI of this staff report.**

- E. The administrative conditional use complies with the applicable requirements for a wireless communication facility as provided by the Land Use Code 20.20.195, including location and design preferences.**

Finding: As conditioned, the proposed wireless facility complies with the location and design preferences as detailed in LUC 20.20.195. Further, the proposal meets all specific Land Use Code requirements applicable to non-exempt wireless communications facilities per LUC 20.20.195.D, as summarized below.

1. Height:

Additional height above the existing PSE utility pole is required to accommodate Verizon's colocation at the minimum height necessary for effective network function. There is no feasible space on the existing poles that does not encroach on the existing power lines while allowing for network needs. PSE's replacement utility poles are stock length sizes of 45 feet, 50 feet and 55 feet for the required class of pole. For the proposed small cell installations, the shortest feasible replacement pole was chosen that could accommodate the wireless equipment and maintain the required clearances. For this proposal, the pole replacements will average a 10-12 foot height increase. **Refer to project drawings in Attachment A to this report for heights specific to each node.**

2. WCF Location and Design

a. Preferred Location (LUC 20.20.195.D.2.a):

Although the location of this "small cell" system is within single family residential neighborhoods, it is third in the list of preferred locations. The location is necessary because the system is specifically targeting Verizon residential users. Because the "small cell" antennas have such a short reach, each needs to be close to the residences it is serving in order to operate as intended.

b. Preferred Facility Design (LUC 20.20.195.D.2.b):

The co-location of the antennas and RRU at each node on utility poles are second on the list of preferred facility design hierarchy. Because the system was designed to reach residential customers, there were no public facility structures, non-residential buildings, or utility support structures available to meet Verizon's needs.

c. Minimizing Adverse Impacts (LUC 20.20.195.D.2.c):

Impacts from siting the installation at each of the 19 nodes were considered when co-locating on existing utility poles in the right of way. Refer to the Development Standards in Section IV.E.4 below for additional ways the applicant will minimize impacts from these installations.

3. **Dispersal Limits (LUC 20.20.195.D.3):** The applicant has verified that there are no other WCF's within 520 feet of this proposal in the public right of way.
4. **Development Standards (LUC 20.20.195.D.4):** The proposal has addressed the following development standards to ensure that the WCF minimizes the adverse impacts - especially visual and aesthetic impacts - on the properties adjacent to rights of way where the facilities will be located and in the vicinity of the facility.

a. Paint and Screening Techniques (LUC 20.20.195.D.4.a):

The small size of "small cell" antennas and RRU's is an effective screening/concealment measure. The size effectively minimizes the visual impacts of a wireless facility on the surrounding neighborhood. All antennas and equipment must meet the definition of "small cells" as defined in Revised Code of Washington (RCW) 80.36.375.

On replacement utility poles all antennas, RRU's, ancillary equipment, conduits, and mounting hardware/ brackets attached to the pole, either existing or proposed, will be painted brown to match the pole. This includes any existing conduits that were placed on the utility poles by other providers and/or PSE. Refer to Conditions of Approval regarding antenna mounting and cabling, antenna and equipment color, and ground mounted equipment in Section VI of this report.

b. Design and Configurations to Minimize Visual Intrusion of the Facility (LUC 20.20.195.D.4.b):

In addition to the relatively small size of the "small cell" antennas and RRU's, particularly when placed against existing electrical infrastructure, the following attributed of the proposed "small cell" design will reduce visual impacts of the system:

- All coaxial cables shall be pulled tight to minimize visual impacts.
- No antennas, RRU's or ancillary equipment may be chained to the utility pole.
- Conduit runs shall be minimized as much as possible and where possible, conduits shall be placed as close as possible to each other.
- Pipe mounts will not extend beyond the top or bottom of the antennas.
- RRU's will be placed within an RRU enclosure.
- All antennas, RRU's, ancillary equipment, conduits, and mounting hardware/ brackets attached to the pole, either existing or proposed, will be painted brown to match the pole.

Refer to Condition of Approval regarding antenna mounting and cabling and antenna and equipment color in Section VI of this report.

c. Construction and Site Restoration Techniques (LUC 20.20.195.D.4.c):

There may be minor clearing associated with the installation five replacement poles, the attachment of the antennas and RRU's, and the connections of the antennas and RRU's connection to necessary utilities, including underground power. All work will be in the public right of way and

will not trigger a clearing and grading permit. However, any disturbance to the right of way must be restored to an equal or better condition and right of way disturbance will be reviewed under the Right of Way Use Permit.

Construction hours will be determined under the Right of Way Use Permit to minimize impacts to surrounding residential neighborhoods and schools. **Refer to Condition of Approval regarding the Right of Way Use Permit in Section VI of this report.**

d. WCF Equipment (LUC 20.20.195.D.4.d):

As proposed and approved in this decision, no ground mounted equipment, including meters, will be allowed at any of the 19 nodes. **Refer to Condition of Approval regarding ground-mounted equipment in Section VI of this report.**

e. Co-location (LUC 20.20.195.D.4.e):

This proposal is for co-location of two antennas and one remote radio unit (RRU) on 19 replacement utility poles. Additional co-location on the pole for other carriers might be a possibility, subject to technical feasibility and approval by PSE. However, specific details or analysis with regards to future co-location have not been included as part of this proposal.

- 5. Radio Frequency Emissions (LUC 20.20.195.D.5):** The Engineering Certification Letter submitted by Verizon's radio frequency (RF) engineer states that the facility will comply with the radio frequency emission standards adopted by the Federal Communications Commission (FCC). This certification letter can be found in the project file at the Record's Department in City Hall.

Although not required by the Land Use Code, the applicant (Verizon) has agreed to provide pre- and post-installation testing of RF emissions to confirm compliance with the FCC regulations. **Refer to Condition of Approval regarding radio frequency testing in Section VI of this report.**

- 6. Setback Requirements for Freestanding Wireless Communication Facilities (LUC 20.20.195.D.6):**

Does not apply, since the proposal installations will be on existing PSE utility poles in the right of way.

- 7. Independent Technical Review (LUC 20.20.195.D.7):**

No such review was deemed necessary for this application since Verizon has agreed to provide pre- and post-installation RF measurements. **Refer to Condition of Approval regarding radio frequency testing in Section VI of this report.**

- 8. Removal of Abandoned Antennas and Towers (LUC 20.20.195.D.8):**
Refer to Condition of Approval regarding abandoned sites in Section VI of this report.

- 9. Removal Upon Undergrounding (LUC 20.20.195.D.9):**
Refer to Condition of Approval regarding removal upon undergrounding in Section VI of this report.

V. DECISION

After conducting the various administrative reviews associated with this proposal, including applicable land use consistency and City Code and Standard compliance reviews, the Director of the Development Services Department does hereby **APPROVE** the proposal subject to the following **CONDITIONS**:

VI. CONDITIONS OF APPROVAL:

The following conditions are imposed under authority referenced:

Compliance with Bellevue City Codes and Ordinances

The applicant shall comply with all applicable Bellevue City Codes, Standards, and Ordinances including but not limited to:

Applicable Codes, Standards & Ordinances

Clearing & Grading Code – BCC 23.76
Construction Codes – BCC Title 23
Fire Code – BCC 23.11
Land Use Code – BCC Title 20
Noise Control – BCC 9.18
Right-of-Way Use Code 14.30
Utility Code – BCC Title 24

Contact Person

Savina Uzunow, (425) 452-7860
Building Division, (425) 452-6864
Derek Landis, (425) 452-4112
Leah Chulsky, (425) 452-6834
Leah Chulsky, (425) 452-6834
Brian Rodan, (425) 452-6056
Jason Felgar, (425) 452-7851

1. Modification to the Administrative Conditional Use (ACU) Plans

Approval of this ACU is for the design and information submitted under this permit application. ANY modification, including but not limited to the provision of additional equipment, meters, antennas, conduit, and fiber to this approval shall be processed as either a new Administrative Conditional Use OR as a Land Use Exemption. The applicant shall demonstrate compliance with the Land Use Code in effect at the time of issuance of this report when the modification occurs within the two-year vesting period. Any modifications of the project design must be reviewed for consistency with the design intent of this report. Conditions of Approval run for the life of the project.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.30E.175

2. Antenna Mounting and Cabling

The antennas shall be attached to the replacement utility pole such that no portion of the antenna extends above the height of the existing support structure (pole).

All proposed cabling shall be **pulled tightly** to minimize visual impacts. Detailed drawings shall be included in the wireless communication facilities in the right of way permit (CA Permit) submittal drawings. The details shall include, but not be limited to the following:

- a) Provide an enhanced detail demonstrating how the cabling will be pulled tight from the antennas to the RRU and from the RRU to the power source.
- b) Provide an enhanced detail that shows how all other cabling and fiber will be installed and how the cabling and aerial fiber will run from the antennas,

equipment, and/or power source through these conduits. Include dimensions for distances between the top of each conduit and the RRU enclosure, antennas, power source, and/or aerial fiber.

- c) Conduit runs shall be minimized as much as possible while still screening as much of the exposed cabling as possible. Where feasible, conduits shall be placed as close as possible to each other.
- d) Methods of attachment must be clearly identified and included in the wireless communication facilities in the right of way permit (CA Permit) submittal drawings and shall maintain the stealth characteristics of each node.
- e) No pipe mounts shall extend past the top or bottom of the antennas.
- f) Multiple RRU's shall be placed within one RRU enclosure.
- g) The applicant shall work with Land Use to verify that the RRU's and antennas shall be placed as close to each other as possible to minimize exposed cabling.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.20.195.B.1.a.v

3. **Antenna and Equipment Color**

- a) **All** antennas (existing and proposed) and **all** associated equipment (including the pipe mounts, ancillary equipment and any existing conduits on the utility pole by others shall be painted *brown* to match the support structure (pole).
- b) *Prior to installation*, color samples shall be submitted as part of the Wireless Communication Facilities (WCF) in the Right of Way Permit (CA Permit). The color will be reviewed under the CA Permit to ensure as close a match as possible to each of the existing and replacement poles. Note that more than one shade of brown may be necessary to provide as close a color match to each individual pole.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.20.195.D.4.a

4. **Ground Mounted Equipment**

As submitted and shown in approval documents, no ground mounted equipment, including meters, will be allowed in any of the 19 nodes that make up this "small cell" network installation.

Reviewer : Leah Chulsky, Land Use
Authority: LUC 20.20.195.D.4

5. **Noise**

To reduce impacts on homes close to the poles, and as proposed by Verizon in this ACU application, no fans, generators or other noise-producing equipment will be allowed as a component of this "small cell" network installation.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.20.195.D

6. Expansion Beyond “Small Cell”

This approval is for a “small cell” network made up of “small cell” antennas and RRU’s, as defined in RCW 80.36.375. Any modifications to these installations that expand the facility at each node such that it no longer qualifies as a “small cell” per the RCW definition or diminishes the stealth characteristics of the nodes shall require additional Land Use review as a new Administrative Conditional Use.

Reviewer: Leah Chulsky, Land Use
Authority: RCW 80.36.375, LUC 20.30E.175

7. Right of Way Use Agreement

No permits, including a Right of Way Use Permit, can be issued and no construction may begin until the applicant has executed a written right of way use agreement, which must be approved by the City Council.

Reviewer: Brian Rodan, Right-of-Way
Authority: BCC 6.04.010 and 14.30.070.B

8. Right-of-Way Use Permit

Any use of the public right of way to install the “small cell” equipment on utility poles and run fiber in the right of way will require a Right of Way Use Permit.

Any disturbance of property in the right of way must be restored to a equal or better condition prior to facility activation.

Reviewer: Brian Rodan, Right-of-Way
Authority: BCC 14.30.070 and 14.30.080

9. Radio Frequency Testing

The applicant (Verizon) will be required to perform a pre- and post-installation radio frequency emission measurement on a minimum of three selected nodes within the “small cell” system. Actual nodes to be tested shall be coordinated between the applicant and Land Use. Results of these measurements shall be submitted as a post-issuance revision to this Administrative Conditional Use permit and included for public view in the project file.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.20.195.D

10. Existing Radio System & Interference

If this telecommunications system causes interference problems with any of the existing radio systems for the City of Bellevue, this system will be required to immediately shut down until the interference can be removed or corrected.

Reviewer: Sean Nichols, Fire Department
Authority: FCC 90.672

11. Completion of Work/Facility Activation

The facility shall not be activated until all work included in the project scope and shown on the plans and specifications is completed.

PRIOR TO ACTIVATION, the applicant shall call for a Land Use Inspection (600 Inspection) under the CA Permit so that Land Use can verify that each node was installed per the approved plans.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.40.425

12. Removal of Abandoned Sites

The owner of this facility shall provide the Director with copies of any notice of intent to cease operations that is provided to the Federal Communications Commission (FCC). All WCFs and the associated equipment shall be removed by the facility owner within 90 days of the date it ceases to be operational, or if the facility falls into disrepair and is not maintained. Disrepair includes structural features, paint, or general lack of maintenance, which could result in safety or visual impacts.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.20.195.D.8

13. Removal Upon Undergrounding

The owner of this facility must remove any of the installations at no expense to the city if the electrical system facility or the utility support structure to which they are attached are subsequently undergrounded.

Reviewer: Leah Chulsky, Land Use
Authority: LUC 20.20.195.D.9

Attachments

Project Plans and Documentation

SEA WILBURTON RF Documentation

Overview:

Verizon Wireless strives to provide excellent wireless service with a network of cell sites that allows our customers to reliably place and receive mobile phone calls and use mobile data. In this particular case, we are trying to remedy coverage challenges in the Wilburton area approximately bounded by NE 8th St. to the north, SE 7th Pl. to the south, 128th Avenue to the west, until NE 2nd St, then by 120th Ave NE to the West, and by NE 131st Ave and 130th Pl SE to the east.

Proposed construction entails development of 19 small cell sites on Puget Sound Energy (PSE) owned utility poles. Small Cell antennas, antennas 24" or shorter, will be used in this application for all small cell nodes. Ancillary equipment known as Remote Radio Units (RRUs) will be mounted on the utility poles. Low power RRUs will be used for these applications to avoid causing signal interference to the existing network. This is necessary due to Wilburton's elevation and far reaching line of site to the surrounding areas. When using the low power RRUs, more sites are necessary to achieve an adequate signal footprint for excellent wireless service.

Deployment Map:

A map showing Verizon Wireless facilities in the City of Bellevue is attached as Exhibit 1A as required by the Bellevue Land Use Code. Please note that this deployment map depicts only outdoor "macro" sites. In-building sites and the proposed small cell system are not included to reduce clutter, and also because in-building sites serve different purposes than macro sites.

Design:

Recognizing jurisdictional need to develop a site that meets the City's design objectives for the Wilburton area, as well as following installation guidelines put in place with PSE specifically for small cell installations, each pole will utilize either one or two panel antennas.

Coverage:

In order to provide excellent wireless service, which Verizon Wireless defines as -85 dBm or better, the antenna height and site location need to provide a line of sight to the roads, offices, and homes where our customers work and reside. Because small cell nodes antenna heights are typically shorter than standard cell sites it is important to ensure that we place the nodes where there is not blockage by terrain or foliage.

The rolling terrain and obstructions caused by surrounding buildings, tree cover, and other structures in the proposed coverage area are another factor for needing many nodes to adequate levels of coverage in the context of surrounding Verizon Wireless sites.

Propagation Maps:

There are several methods for determining where coverage gaps exist within a given network of wireless sites. One of these is through the use of propagation maps. The propagation map is a computer simulation of the strength of Verizon Wireless signals at a given height and location in the context of the network. Propagation maps are one tool for determining whether a proposed site will meet the coverage objective and what antenna height is needed to provide robust service for Verizon Wireless customers. The radio propagation tool is designed to take factors such as terrain and tree coverage into account, and is calibrated

with drive test data so that it depicts a reliable estimate of coverage that would be provided by a proposed site. The propagation maps that follow show three levels of service, designated as the following colors:

Green ≥ -85 dBm, a level of service adequate for providing reliable coverage inside a building

Yellow ≥ -95 dBm, a level of service adequate for providing reliable coverage outdoors or inside a car

Gray ≥ 105 dBm, a level of service adequate for providing reliable coverage outdoors

Other ≤ 105 dBm, unreliable signal strength, may not be capable of reliably making and holding a call depending on environment

Exhibit 1B is a propagation map that shows the existing level of coverage in the proposed service area in the context of surrounding Verizon Wireless sites. Exhibit 1C shows the level of service that would be provided with the proposed small cell nodes.

Wireless E-911

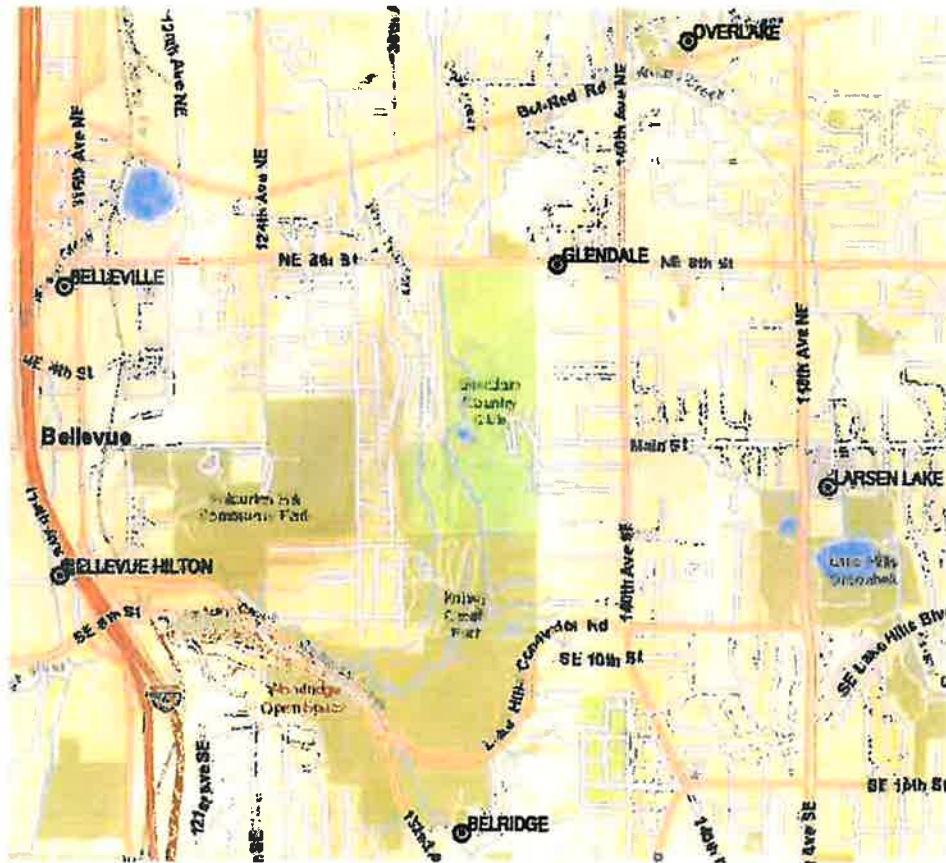
Approximately 400,000 Wireless 911 calls are made every day nationwide, and this number continues to increase. (Source: CTIA, the Wireless Association) Wireless E-911 service depends on reliable signal strength and a fairly dense network of antenna sites in order to function effectively. Because of our federally-mandated obligation to provide wireless E-911 service, signal reliability is paramount. As discussed in the narrative above and shown in the propagation exhibits submitted with this request, the proposed site will help fill a coverage and capacity gap in the Verizon Wireless network in the Wilburton area of the City of Bellevue. The proposed antenna height and design of the proposed facility are the minimum required for the effective functioning of the proposed wireless site.

Sincerely,

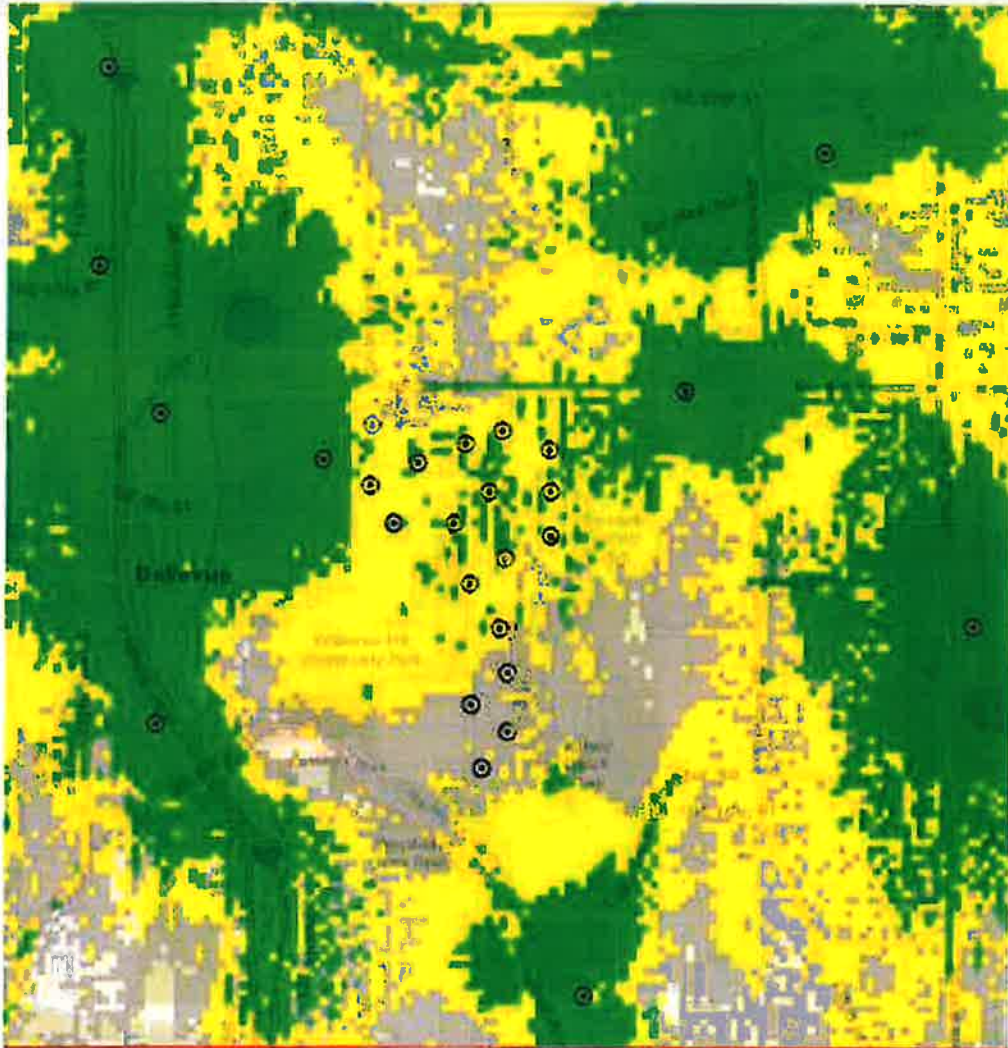


Krystal Taylor
Radio Frequency Engineer
Verizon Wireless

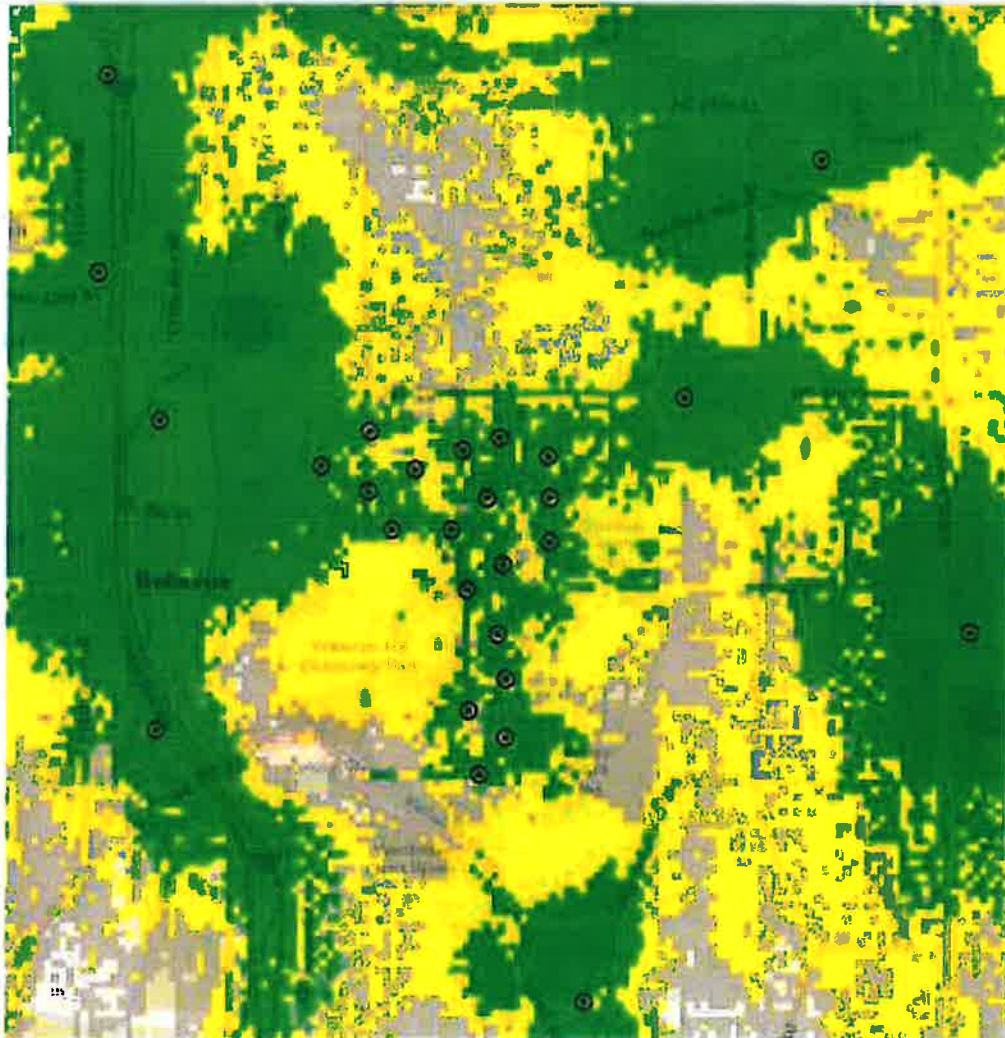
EX. 1A - DEPLOYMENT MAP



EX. 1B - PROPAGATION "BEFORE"



EX. 1C- PROPAGATION "AFTER"



THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE
MICHAEL H. MEHIGAN, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
CONSULTANTS

HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151
FACSIMILE (206) 789-9834
E-MAIL pinion@hatdaw.com

MAURY L. HATFIELD, PE
(1942 – 2009)
PAUL W. LEONARD, PE
(1925 – 2011)

NON-IONIZING ELECTROMAGNETIC EXPOSURE
ANALYSIS
AND
ENGINEERING CERTIFICATION

PREPARED FOR

Verizon Wireless

“SEA WILBURTON”

PROPOSED SMALL CELL FACILITY

WITH 19 NODES IN

THE CITY OF BELLEVUE

KING COUNTY, WASHINGTON

Received

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Permit Processing

INTRODUCTION

Hatfield & Dawson Consulting Engineers has been retained to evaluate the proposed Verizon Wireless small cell personal wireless telecommunications facility "SEA WILBURTON" for compliance with current Federal Communications Commission (FCC) and local guidelines regarding public exposure to radio frequency (RF) electromagnetic fields (EMFs).

BACKGROUND

The Verizon facility will have nineteen (19) new small cell nodes with antennas installed on replacement Puget Sound Energy (PSE) wooden electrical utility poles within a geographical polygon in the City of Bellevue, King County, Washington

According to information furnished by Verizon representatives, all of the Verizon small cell antennas will be mounted and centered at least 32.5 feet above grade. Thus all of the pole-mounted Verizon antennas will be well above head height for persons standing at ground level near the project poles.

The project poles do not appear to have climbing appurtenances. Therefore it is unlikely that anyone other than authorized and RF cognizant workers could approach near enough to the Verizon antennas to cause that person's RF exposure to exceed FCC limits. Safety disconnect switches will be mounted on the project poles to deactivate the antennas when personnel are required to work in the vicinity of the antennas.

The proposed antennas will project the majority of the transmitted RF energy horizontally away from the project poles, and above all nearby habitable areas. Very little energy will be directed downwards towards ground level or the nearest occupancies. Therefore RF exposure conditions near the project poles, and on adjacent properties, due to the combined contributions from all of the proposed Verizon wireless operations, will be well below the FCC general population/uncontrolled ("Public") Maximum Permissible Exposure (MPE) limits, and the limits given in King County code K.C.C. 21A.26.100 "NIER exposure standards."

It is expected that the RF exposure environment in publicly-accessible areas near the project poles will be far less than the FCC Public MPE limit due to all Verizon wireless operations at the project sites. ***The operation of the Verizon small cell facility will NOT create significant RF exposure conditions in any occupancy, habitable area or publicly accessible area.***

DETAILED RF EXPOSURE ANALYSIS

The following RF exposure analysis is based on information provided by Verizon representatives, and known characteristics of typical small cell wireless facilities. The analysis provides a “worst-case” model for calculating maximum general population/uncontrolled (“Public”) RF power densities and exposure conditions.

Theoretical calculations and worst-case exposure predictions indicate that exposure conditions in non-excluded, publicly-accessible areas due to the Verizon small cell facility will be far less than the 100% FCC Public MPE limit.

Verizon RF engineer Krystal Taylor has provided the following information about the proposed wireless operations. The small cell facility will operate within the 2.1 GHz Advanced Wireless Service (AWS) “A” and “B” bands. The column “MPE Limit (mW/cm²)” shows the lowest MPE limit established by the FCC for AWS transmissions in terms of the equivalent plane-wave power density limit.

Frequency ranges and MPE limit for Verizon wireless operations:

<u>Band</u>	<u>Sub-band</u>	<u>Transmit & Receive Frequencies(MHZ)</u>		<u>MPE Limit (mw/cm²)</u>
AWS1	A & B	2110-2130	1710-1730	1.000

TRANSMITTER CHARACTERISTICS

Small cell facilities are intrinsically low powered. The proposed RF transmitters have a maximum output power of approximately 20 watts, which is one third the power of macrocell transmitters.

The LTE modulation technology employed by Verizon utilizes multiple-input, multiple-output (MIMO) signaling, so there are typically two radio transmitters for each antenna sector. Each antenna sector will be fed by one remote radio unit (RRU), and each RRU has two 20 watt transmitters. Therefore the total power for each antenna sector will be 40 watts = 2 x 20 watts.

ANTENNA CHARACTERISTICS

There will be one antenna for each of the two antenna sectors on each of the poles. Both antennas will be a 16 x 24 inch dual-polarized Amphenol panel type, model HTXCWW4513F000-2100, with 14.0 dBi gain in the 2.1 GHz AWS frequency band. The maximum nominal Effective Radiated Power (ERP) output power per antenna will be approximately 546 watts. This calculation assumes that the maximum 40 watt RRU output into the antenna is attenuated by a 0.5 dB loss for the cables that connect the RRUs to the antennas.

RF EXPOSURE PREDICTIONS AND CALCULATION METHODOLOGY

Personal wireless and microwave facilities are required to comply with the FCC "Rules & Regulations" **47 CFR §1.1310, Radiofrequency radiation exposure limits**. The exposure limits shown in the table titled "NIER Exposure Standards (1) (6)" in K.C.C. 21A.26.100 "NIER exposure standards" are generally in agreement with FCC exposure guidelines and limits.

In any case, since the FCC exposure limits supersede the limits shown in the aforementioned table, then compliance is determined by comparing RF field predictions with the general Public Maximum Permissible Exposure (MPE) limits allowed by the FCC rules and guidelines, as specified in **47 CFR §1.1310**.

The FCC document ***Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65, August 1997***, describes the methods established by the FCC for predicting compliance with the FCC-specified exposure limits.

PREDICTED RF EXPOSURE CONDITIONS NEAR GROUND LEVEL

RF power densities and exposure levels **near ground level** are computed in accordance with methods described in OET Bulletin 65. The following formula, derived from Equation 9 on page 21 and Equation 10 on page 22 of the bulletin, has been used to calculate the power densities at ground level locations:

$$S(\text{mW/cm}^2) = 0.360 \times \text{ERP (watts)} / (\text{Distance in feet})^2 \quad (\text{A})$$

This formula includes the effect of signal reflections from the ground. The Effective Radiated Power (ERP) in a particular direction depends on the vertical and horizontal antenna patterns. A composite vertical antenna pattern is used to determine the predicted power density. This composite antenna pattern is a worst-case envelope that encompasses the maximums of the downward lobes of the vertical patterns of the Verizon antennas.

The ground-level calculations assume that the vertical patterns of the Verizon small cell antennas suppress the maximum ERP downwards towards all publicly accessible areas by a factor of 10dB at the Verizon AWS frequencies.

It is necessary to consider the combined ERP for all channels from only a single small cell antenna sector, and not the total ERP for the entire facility, since it is not likely that an individual would be exposed to the maximum ERP of more than one antenna sector simultaneously. The FCC addresses this issue on page 65 of the OET Bulletin 65:

“For the case of transmitting facilities using sectorized transmitting antennas, applicants and licensees should apply the criteria to all transmitting channels in a given sector, noting that for a highly directional antenna there is relatively little contribution to ERP or EIRP summation for other directions.”

Therefore it is correct to use the maximum ERP from a single antenna, and not the total ERPs from the entire small cell facility, to determine human RF exposure conditions at specific locations.

The highest downwards ERP will be 54.6 watts from the proposed antennas. By use of the power density formula (A), with input values of 54.6 watts ERP, and a distance of 26.5 feet from the antenna center lines to a 6-foot head-height, the worst-case calculated power density is 0.0280 mW/cm². The Public MPE limit for the AWS frequency bands is 1.0 mW/cm². The worst-case calculated exposure condition resulting from the AWS operations is the power density divided by the Public MPE limit for AWS frequencies:

$$2.80\% \text{ of the Public MPE limit} = 100\% \times 0.0280 / 1.0$$

Therefore all publicly accessible areas near the project poles are expected to have worst-case exposure conditions less than 2.80% of the Public MPE due to the Verizon small cell operations. This maximum predicted cumulative Public exposure condition is less than 1/35th of the 100% MPE limit. ***The Verizon small cell facility will contribute far less than 100% of the FCC Public exposure limit to the RF exposure environment near ground level on any property near the project poles.***

PREDICTED RF EXPOSURE CONDITIONS FOR WORST-CASE RESIDENTIAL EXPOSURE

RF power densities and exposure levels **well above ground level** are computed in accordance with methods described in OET Bulletin 65 using the following formula (B). The following formula, derived from Equation 5 on page 20 of the bulletin, has been used to calculate the power densities at specific elevated locations:

$$S(\text{mW/cm}^2) = 0.141 \times \text{ERP (watts)} / (\text{Distance in feet})^2 \quad (\text{B})$$

The Effective Radiated Power (ERP) levels used in this formula is the maximum 546 watts. The effect of signal reflections from the ground is not included because the calculation height for all antenna apertures in all nodes is at least 32.5 feet above grade. Formula (B) can be used to predict the worst-case exposure conditions for the residential structure closest to any of the project poles.

Cameron Owens of Md7 has determined that the residential structure closest to any of the poles is approximately 15 feet horizontally from the Node 9 utility pole.

The small cell antennas in Node 9 will have center line heights of approximately 37 feet above grade. It will be assumed for the worst case conditions that the nearest residential structural will be in the main beam of the nearest antenna, at the aperture height of that antenna, and 15 feet away from the antenna. The maximum ERP will be 546 watts from the Node 9 antennas.

By use of the power density formula (B), with input values of 546 watts ERP, and a distance of 15 feet, the worst-case calculated power density due to the Verizon operations is 0.3422 mW/cm^2 . The Public MPE limit for the AWS frequency bands is 1.0 mW/cm^2 . The worst-case calculated exposure condition resulting from the Verizon operations is the power density divided by the Public MPE limit for AWS frequencies:

$$34.2\% \text{ of the Public MPE limit} = 100\% \times 0.3422 / 1.0$$

Therefore the residence nearest to the Node 9 project pole is expected to have worst-case exposure conditions less than 34.2% of the Public MPE due to the Verizon small cell operations. This maximum predicted cumulative Public exposure condition is approximately $1/3^{\text{rd}}$ of the 100% MPE limit.

Therefore the proposed Verizon small cell facility will not cause any occupancy or habitable area of a structure to exceed the FCC limits for human exposure to radio frequency electromagnetic fields.

COMPLIANCE WITH FCC AND LOCAL REGULATIONS

The FCC has determined through calculations and technical analysis that personal wireless facilities, such as those operated by Verizon, are highly unlikely to cause human RF exposures in excess of FCC guideline limits.

Hatfield & Dawson Consulting Engineers

According to the FCC rules and the FCC prediction methodologies, as demonstrated by the analysis presented in this report, the Verizon personal wireless small cell facility will be in compliance with the FCC RF exposure rules and guidelines.

The Verizon facility is expected to be compliant with FCC rules regarding public RF exposure provided that direct access to the pole-mounted antennas is positively restricted. ***The operation of the small cell facility will not cause the RF exposure environment within any publicly accessible area, occupancy or habitable area of a structure to exceed the FCC limits for human exposure to radio frequency electromagnetic fields. In fact the Verizon wireless operations at the project sites will not have a significant environmental impact, as defined by the FCC Public MPE limits. Furthermore, the Verizon small cell facility will not cause any nearby existing wireless facility to exceed non-ionizing electromagnetic radiation (NIE) exposure standards.***

COMPLIANCE WITH FCC REGULATIONS FOR RF EMISSIONS AND RF INTERFERENCE

It is expected that the RF interaction between all of the Verizon Wireless operations will be low enough to preclude the likelihood of localized interference caused by the Verizon small cell facility to the reception of any other communications signals. All of the Verizon antennas will be sufficiently high enough, and far enough removed from all occupancies, that they are unlikely to cause interference with nearby consumer receivers or other consumer electronic devices.

Transmission equipment for the Verizon facility is certified by the FCC under the equipment authorization procedures set forth in the FCC rules and guidelines. This assures that the wireless facility will transmit within the desired base-station frequency bands at authorized power levels. The Verizon facility will operate in accordance with all FCC rules and guidelines regarding power, signal bandwidth, interference mitigation, and good RF engineering practices. Therefore the Verizon facility will be in compliance with federal rules and guidelines, and with local regulations concerning RF emissions per K.C.C. 21A.26.090 "Interference."

CONCLUSIONS BASED ON FCC REGULATIONS FOR RF EMISSIONS

The Verizon Wireless facility "SEA WILBURTON" will be in compliance with current FCC and local rules regarding radio frequency interference and public exposure to radio frequency electromagnetic fields provided that direct access to the antennas on the project sites is positively restricted to authorized and RF cognizant workers. This conclusion is based on information supplied by Verizon representatives, and estimates of future RF exposure conditions due to the Verizon facility in specific areas with the corresponding safe exposure guidelines set forth in the FCC rules and guidelines, and in King County K.C.C. Chapter 21A.26.

The FCC exposure limits are based on recommendations by federal and private entities with the appropriate expertise in human safety issues. Under the Commission's rules and guidelines, licensees are required to ensure compliance with the limits for maximum permissible exposure (MPE) established by the FCC. These limits have been developed based on guidelines provided by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and the National Council on Radiation Protection and Measurements (NCRP). Both the NCRP and IEEE guidelines were developed by scientists and engineers with a great deal of experience and knowledge in the area of RF biological effects and related issues.

To ensure full compliance with FCC rules and guidelines regarding human exposure to RF fields, the Verizon transmitters should be turned off whenever personnel are required to work in the vicinity of the small cell antenna apertures. This safety procedure should apply to all existing and future wireless transmission facilities at the project sites. All instances of antenna-related work require deactivation of the subject antennas.

COMPLIANCE WITH LOCAL REGULATIONS

Because the Verizon wireless facility will be in compliance with federal rules and guidelines, it will also be in compliance with local regulations concerning RF emissions per K.C.C. 21A.26.090, etc. The following is the complete text of 47 U.S.C. § 332(c)(7)(B)(iv):

"No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."

QUALIFICATIONS

I am a Senior Member of the IEEE. As a partner in the firm of Hatfield & Dawson Consulting Engineers I am registered as a Professional Engineer in the States of Washington, Oregon, California and Hawaii. I am an experienced radio engineer with over 35 years of professional engineering experience whose qualifications are a matter of record with the Federal Communications Commission, and I hold an FCC General Radiotelephone Operator License PG-12-21740.

All representations contained herein are true to the best of my knowledge.

April 17, 2018



David J. Pinion, P.E.

Hatfield & Dawson Consulting Engineers